QAPP Worksheet #10
Problem Definition

The problem to be addressed by the project:

In fall 2017, the EPA entered into an Administrative Settlement and Agreement Order on Consent (ASAOC) with the Pre-RD Group to conduct agreed-upon work at the Site. As part of the Portland Harbor Pre-RD project, AECOM and Geosyntec, on behalf of the Pre-RD Group, are implementing a field sampling program to support the remedial design, refine the conceptual site model (CSM), and establish a baseline dataset for comparisons to post-remedy conditions. Sampling of surface, subsurface, and sediment trap sediment, surface water, porewater, and fish tissue will be conducted. On behalf of the EPA, CDM Smith will provide oversight and will collect and analyze split samples. A total of 29 splits will be collected with the total made up from splits for all media. The determination of which media will be targeted for splits and where splits would be collected will be made by the EPA prior to each sampling event. The oversight program is designed to provide technical review and evaluation of AECOM and Geosyntec implementation of field sampling plans. Split sampling may be conducted during the following field tasks:

- Surface Water and Sediment Trap Sampling: Oversight will include field observation of the field activities and collection of split samples. This includes three sampling events: low-flow conditions, high-flow conditions and a storm-water influenced conditions during March, July and November 2018. Composite surface water samples and sediment trap samples will be collected during each two-week sampling event.

- Grab Surface Sediment Sampling: Surface sediment sampling is expected to be conducted from April 2 through June 2, 2018. Samples will be collected as three-point composites from 0 to 30 cm depth. Samples will be processed on the sampling vessel.

- Porewater Sampling: Porewater sampling will be conducted during sediment sampling with custom-designed peepers that will be deployed from a vessel.

- Subsurface Sediment Core Sampling: Subsurface sediment core sampling is expected to be conducted over four weeks from July 2 through July 28, 2018. Sediment coring will be conducted with a Vibratory Core Tube Driver. Sediment cores will be processed at AECOM's Sample Processing Facility in Portland.

- Fish Tissue Sampling: Small mouth bass will be collected during two 10 to 12-day events from July 30 through September 22, 2018. The sampling schedule may be affected by adverse weather or fishing success. Fish will be caught by hook-and-angling and/or electrofishing if hook-and-angling does not provide sufficient fish.

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The environmental question being asked:

- Are the analytical results reported by the Pre-RD Group and EPA's laboratory in agreement?
- Is field work conducted compliant with the Pre-RD Group's QAPP/Work Plan?

Secondary data:

See Worksheet 13

The possible classes of contaminants and the affected matrices:

Splits will potentially be collected for the following analyses:

- Polychlorinated Biphenyls (PCBs) in sediment, and fish tissue
- Dioxins/Furans (PCDD/PCDF) in sediment and fish tissue
- Polycyclic Aromatic Hydrocarbons (PAHs) in sediment and fish tissue
- Semivolatile Organic Compounds (SVOCs) in surface water, sediment, and fish tissue
- Metals in surface water, sediment, and fish tissue

Project decision conditions ("If..., then..." statements):

- If field work is inconsistent with the Pre-RD Group's QAPP, prepared by AECOM, then the field oversight staff will verify tasks with respect to the AECOM QAPP, and HASP and note deviations with the AECOM field project leader and document such discussions in the Daily Field Summary Reports submitted to EPA. The CDM Smith Field Oversight Task Manager and EPA RPM will be informed of deviations.
- If the relative percent differences (RPDs) and/or Agreement factors between CDM Smith's data and the Pre-RD Group data are deemed unacceptable, then the data may not be considered comparable. If this is the case, it will be noted in the Final Summary Reports submitted to EPA.

CDM Smith will present the data findings in Field Summary Reports after completion of sampling for each type of media and submit it to the EPA who will then determine if any additional actions are required.

QAPP Worksheet #11
Project Quality Objectives /Systematic Planning Process Statements

Who Will Use the Data? EPA Region 10

What Will the Data be Used For?

Oversight activities will monitor the Pre-RD Group-implemented field sampling program to verify that elements of the approved Field Sampling Plans (FSPs) and QAPPs are fulfilled. Split sample data will be compared to the parent samples collected by the Pre-RD Group to determine if a bias exists in the data produced by the Pre-RD Group.

Split sample data will be compared to the RPD and Agreement Factor (AF) project criteria to determine if a potential analytical bias exists in the Pre-RD dataset that could impact the use of the data for its intended purposes. EPA will collect a total of 29 split samples for all media collected under the Pre-RD Group's sampling program. EPA will determine when and where split samples will be collected no less than one week prior to a sampling event. Twenty-nine splits for all media for the extensive sampling program will not provide a sufficient number of splits for extensive statistical analysis of the two sets of data (parent samples and splits.). However, split sample data will allow for comparison to the RPD and Agreement Factor (AF) project criteria to determine if a potential analytical bias exists in the Pre-RD dataset that could impact the use of the data for its intended purposes. Further details on how the parent and split sample results will be compared is provided on Worksheet#37.

A total of 30 split samples comprised of splits for all media will be collected. EPA will determine when and where split samples will be collected no less than one week prior to a sampling event. Twenty-nine splits for all media for the planned sampling program will not provide sufficient numbers of splits for meaningful statistical analysis of the two sets of data (parent samples and splits.) Details on how the parent and split sample results will be compared is provided on Worksheet#37.

Split QC data will be used to determine the EPA's split samples data quality and comparability with the Pre-RD Group's data and whether sample results are acceptable based on the established project data quality objectives (DQOs). QC sample results will be compared to the measurement performance criteria (MPC) of the data quality indicators (DQIs).

To further achieve these objectives, CDM Smith field personnel will observe the Pre-RD Group's contractors field implementation of the FSPs and QAPP and note any deviations. Deviations will be brought to the attention of the Pre-RD group contractor, and reported to the CDM Smith Field Oversight Task Manager who will communicate this information to the EPA RPM. These will be documented in the Daily Field Summaries and include a discussion of the impact of the deviation(s) on data quality. The Pre-RD's Group contractor's activities will be documented in the field logbook and oversight forms. A copy of the oversight forms are provided in Appendix B.

What Type of Data is Needed?

Data needs include: Analyses of split samples for PCBs, PCDD/PCDFs, PAHs, SVOCs, and metals.

How much data are needed?

Split samples will be collected from up to 30 samples (comprised of all matrices) to determine if a bias exists in the data produced by the Pre-RD Group. Oversight activities are listed in Worksheet 10. The split sample program includes: fish tissue, sediment, surface water and porewater split samples.

How "good" do the data need to be to support the environmental decision?

Definitive level data is required for full validation of the data. A CLP laboratory will perform the high-resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS) analyses and the Region 10 MEL laboratory will perform all other analyses. The HRGC/HRMS CRQLs are published in the CLP statement of work and MEL has provided reporting level information. To meet the cleanup criteria for many target analytes, reporting limits (RLs) need to be extremely low and the achievable reporting limits for the following analyses/chemicals will not meet the cleanup levels as noted on Worksheet #15. These chemicals and media include:

- Arsenic in surface water
- Arsenic in fish tissue
- Pentachlorophenol in surface water
- Dioxin/Furans in sediment/tissue (Note: There is a 20-sample minimum to modify the CLP analysis, which would be required to report to levels below the CRQLs)

As a result samples that are expected to have higher levels of contamination will be targeted for splits to provide good comparison data. CDM Smith has notified EPA's Region 10 RSCC about the need for low reporting limits to achieve the project data quality objectives for sensitivity if possible.

All analytical results will require the full Stage 4 data validation process. Validation of data will be performed by supervisory chemists at the Region 10 MEL for data generated by MEL and by Region 10 chemists for the data generated by the CLP laboratory(ies).

Where, when, and how should the data be collected?

Sampling and field procedures are described in the Pre-RD Group's FSPs and QAPP. Sampling oversight will be performed according to the Pre-RD Group's schedule. The Pre-RD Group-implemented field program is anticipated to include surface sediment and porewater sampling, sediment core sampling, high-volume and peristaltic pump surface water sampling, sediment trap sampling, and small mouth bass sampling from March 2018 through November 2018 (refer to Worksheet 16). The sampling locations are provided in the Pre-RD Group's task-specific FSPs and QAPP. Split sampling locations will be determined by EPA prior to each sampling event. The Pre-RD Group's FSPs detail the sampling procedures which describe how the data will be collected.

The splits will be analytical splits and will be collected after field processing of samples and just prior to filling sample containers. The PCBs, PCDD/PCDF, PAHs, and pesticide analyses for surface water will be collected with high-volume sampling on XAD-2 resin columns and the SVOCs and metals analyses will be collected with a peristaltic pump into a Teflon®-lined carboy simultaneously with the high-volume analysis collections on XAD-2 columns. Splits will be collected for the peristaltic pump parameters (semivolatiles and metals) analyses only. The sample bottles for each split analysis will be collected directly before or after the corresponding analysis bottle collection for the Pre-RD Group.

Splits obtained for sediment samples will be taken after all field processing, compositing, and homogenization of the sediment just prior to filling sample jars and fish tissue splits would be obtained from the homogenized tissue after whole-body homogenization by the Pre-RD Group's laboratory (SGS - AXYS in Sidney, British Columbia).

Who will collect and generate the data

CDM Smith oversight staff will record field observations and obtain split samples from the Pre-RD Group's contractor while the field sampling program is being conducted.

How will the data be reported?

- Field observations will be recorded using field oversight forms provided in Appendix A.
- Final verified/validated data will be submitted to CDM Smith and the EPA RPM in electronic format from the Region 10 MEL laboratory and will be available from the CLP laboratory at the Sample Management Office (SMO) portal once validation has been completed by the Region 10 chemist.
- Following completion of sampling for each type of media, laboratory analyses and receipt of all electronic and hard-copy data, results will be presented in Field Summary reports generated by CDM Smith and submitted to EPA for each media
- Report(s) will include tabulated results and a discussion of the data quality and its comparability with the Pre-RD Group's data. This review will be used to evaluate the accuracy of the Pre-RD Group data.

How will the data be archived?

- Chain of custody information will be uploaded to the SMO website for archiving and transmittal of information to the CLP laboratories. Data generated by EPA's Region 10 MEL laboratory will be e-mailed to CDM Smith and CLP data will be downloaded from the SMO portal.
- Final MEL and CLP data will be submitted in electronic format.
- Final, validated, electronic analytical data will be directly uploaded to Scribe to be available for EPA Region 10.

Records and documents will be archived in the CDM Smith PojectWise archiving system. When samples are shipped, a chain of custody (COC) XML (.xml) file and the CLP Superset Deliverable file (.xls) will be exported from Scribe and sent to the Region 10 RSCC each day. The COC XML file is uploaded to the SMO portal on each day of shipment. The project will also be published to Scribe.net. When samples are shipped to MEL, a shipment notification will also be sent to the Region 10 RSCC and the COCs will be uploaded to SMO portal. PDF copies of data packages will also be archived in the CDM Smith ProjectWise archiving system file. After final laboratory data has been entered into the CDM Smith database, it will be exported and uploaded to Scribe.net. The final complete Scribe file will be backed up and the .bac file sent to the EPA RSCC.

QAPP Worksheet #18
Split Sampling Locations and Methods/SOP Requirements Table

Sampling Location ID Number	Matrix	Depth	Analytical Group	Concentration Level	Estimated Number of Samples (identify field duplicates)[1]	Sampling SOP Reference	Rationale for Sampling Location[2]
TBD	Surface water split samples	———	SVOCs and metals	Low	TBD – no duplicates are required	Refer to Pre-RD Group QAPP (AECOM 2018)	See Worksheet 17a
TBD	Porewater split samples	TBD	metals	Low	TBD – no duplicates are required	Refer to Pre-RD Group QAPP (AECOM 2018)	See Worksheet 17a
TBD	Surface sediment split samples	TBD	PCB congeners, PCDD/PCDF, PAHs, SVOCs, and metals	Low	TBD – no duplicates are required	Refer to Pre-RD Group QAPP (AECOM 2018)	See Worksheet 17a
TBD	Subsurface sediment split samples	TBD	PCB congeners, PCDD/PCDF, PAHs, SVOCs, and metals	Low	TBD – no duplicates are required	Refer to Pre-RD Group QAPP (AECOM 2018)	See Worksheet 17a
TBD	Fish Tissue split samples	TBD	PCB congeners, PCDD/PCDF, PAHs, SVOCs, and metals	Low	TBD – no duplicates are required	Refer to Pre-RD Group QAPP (AECOM 2018)	See Worksheet 17a

[1] A maximum of 29 total splits will be collected.

[2] Rationale for sampling locations are documented in the AECOM QAPP. Split sample locations will be determined by EPA.

QAPP Worksheet #20
Field Quality Control Sample Summary Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of Extra Volume Laboratory QC (MS/Duplicate) Samples	No. of Equipment Blanks	No. of Trip. Blanks	No of PE Samples	Total No. of Samples
Surface water/Pore water	SVOCs	Variable	TBD	5	NA	1 per media if sufficient volume	0	0	0	TBD
	Total Metals	Variable	EPA 200.2/200.7/200.8 IN_P2002Bv10, In_P2007Bv9, In_A7700Av3	5	NA	1 per media if sufficient volume	0	0	0	TBD
Sediment	PCBs	Variable	HRSM01.2	17	NA	0	0	0	0	TBD
	PCDD/ PCDF	Variable	HRSM01.2	17	NA	0	0	0	0	TBD
	SVOCs	Variable	8270D	17	NA	1 per media if sufficient mass	0	0	0	TBD
	PAHs	Variable	EPA 8270D-SIM	17	NA	1 per media if sufficient mass	0	0	0	TBD
	Metals	Variable	EPA 200.8/200.7/245.2	17	NA	1 per media if sufficient mass	0	0	0	TBD
Fish Tissue	PCBs	Variable	HRSM01.2	7	NA	1 per media if sufficient mass	0	0	0	TBD
	PCDD/ PCDF	Variable	HRSM01.2	7	NA	1 per media if sufficient mass	0	0	0	TBD
	Metals	Variable	EPA 200.8, 200.7/245.2	7	NA	1 per media if sufficient mass	0	0	0	TBD